Partial Groups Problem Situations - Division

1. Solve each problem with direct modeling. Describe your reasoning.
   a. A punch recipe calls for 2 cups of sugar. How many batches can I make with 6 cups of sugar?

   b. A punch recipe calls for $\frac{1}{2}$ cup of sugar. How many batches can I make with 6 cups of sugar?

   c. A punch recipe calls for $\frac{1}{2}$ cup of sugar. How many batches can I make with $\frac{3}{4}$ cup of sugar?

   d. A punch recipe calls for $\frac{1}{2}$ cup of sugar. How much of a batch can I make with $\frac{3}{8}$ cup of sugar?

2. Complete the following table for each word problem.

Word Problem	Number of Groups	Amount per Group	Total	Possible Equation(s)	Problem Type
A punch recipe calls for 2 cups of sugar. How many batches can I make with 6 cups of sugar?					
A punch recipe calls for $\frac{1}{2}$ cup of sugar. How many batches can I make with 6 cups of sugar?					
A punch recipe calls for $\frac{1}{2}$ cup of sugar. How many batches can I make with $\frac{3}{4}$ cup of sugar?					
A punch recipe calls for $\frac{1}{2}$ cup of sugar. How much of a batch can I make with $\frac{3}{8}$ cup of sugar?					

Adapted from: Empson, S. B. and Levi, L. (2011). *Extending Children's Mathematics: Fractions & Decimals, Innovations in Cognitively Guided Instruction.* Portsmouth, NH: Heinemann.

Note: The last two problems are Partial Groups problems. A Partial Groups problem is one in which the number of groups is not a whole number. A Multiple Groups problem is one in which there is a whole number of groups and a fractional amount in each group where the fraction is not equal to a whole number. An Equal Sharing problem is one type of Multiple Group problem.

3. Solve each problem with direct modeling. Describe your reasoning.
   a. I have 6 cups of sugar. I have enough sugar to make a double batch of punch. How much sugar is needed for one batch?

   b. I have 6 cups of sugar. I have enough sugar to make $\frac{3}{4}$ of a batch of punch. How much sugar is needed for a full batch?

   c. I have $\frac{3}{8}$ cup of sugar. I have enough sugar to make $\frac{3}{4}$ of a batch of punch. How much sugar is needed for a full batch?

   d. I have $\frac{1}{2}$ cup of sugar. I have enough sugar to make $\frac{3}{4}$ of a batch of punch. How much sugar is needed for a full batch?

4. Complete the following table for each word problem.

Word Problem	Number of Groups	Amount per Group	Total	Possible Equation(s)	Problem Type
I have 6 cups of sugar. I have enough sugar to make a double batch of punch. How much sugar is needed for one batch?					
I have 6 cups of sugar. I have enough sugar to make $\frac{3}{4}$ of a batch of punch. How much sugar is needed for a full batch?					
I have $\frac{3}{8}$ cup of sugar. I have enough sugar to make $\frac{3}{4}$ of a batch of punch. How much sugar is needed for a full batch?					
I have $\frac{1}{2}$ cup of sugar. I have enough sugar to make $\frac{3}{4}$ of a batch of punch. How much sugar is needed for a full batch?					

Adapted from: Empson, S. B. and Levi, L. (2011). *Extending Children's Mathematics: Fractions & Decimals, Innovations in Cognitively Guided Instruction.* Portsmouth, NH: Heinemann.

Note: The last two problems are Partial Groups problems. A Partial Groups problem is one in which the number of groups is not a whole number. A Multiple Groups problem is one in which there is a whole number of groups and a fractional amount in each group where the fraction is not equal to a whole number. An Equal Sharing problem is one type of Multiple Group problem.

5. Select one problem from page 1 or 3 and use the problem to make sense of the traditional algorithm for dividing fractions.